MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2018/2019

ECP1016 – COMPUTER AND PROGRAM DESIGN

(ME/RE/TE)

31 MAY 2019
9.00 a.m. - 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This booklet consists of 4 pages excluding cover pages with 4 questions only.
2. Attempt **ALL** questions given. All questions carry equal marks and distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Question 1

a) Identify the enabling technologies for each computer generation, from the first generation to the fifth generation.

[5 marks]

b) Is C a high level programming language or a scripting language? Why?

[3 marks]

c) Briefly explain the six phases of the waterfall software development model.

[6 marks]

d) Using a flowchart, design an algorithm of a program that, determines a student's cumulative grade point average (CGPA) and degree classification based on the cumulative total grade points and cumulative total credit hours given by user.
The formula for the CGPA calculation is given by;

$$CGPA = \frac{Cumulative\ total\ grade\ points}{Cumulative\ total\ credit\ hours}$$

Table Q1.1 shows the degree classification based on CGPA

Table Q1.1

CGPA	Classification
3.67 –4.00	1st class
3.33 –3.66	2nd upper class
2.67 –3.32	2nd lower class
2.0–2.66	3rd class
<2.0	Fail

[11 marks]

Continued .....

Question 2

a) The program in Figure Q2.1 contains some programming errors:

```
#include <studio.h>
int main(){
      char str = 'hello world';
      int a = 100;
      float b = 1.2345;

      print("%6.5s/n", str);
      print("%+6.5d/n", b);
      prinf("%6.5f/n", a);

      return 0;
}
```

Figure Q2.1

i. Identify and correct the errors [7 marks]

ii. Give the formatted output of the corrected program [3 marks]

b) Write a program that reads an integer, determines and prints the number of occurrences of the digit '7'. Figure Q2.2 shows a sample output. (HINT: use remainder and division operators)

Figure Q2.2

[10 marks]

c) Write a single C statement that performs each of the following tasks

i. Declare an integer array called `iArr` that saves the following values: 10, 20, 30, 40

ii. Declare an integer pointer called `iPtr`

iii. Make `iPtr` points to the first element of `iArr`

iv. Print the third element of `iArr` using array notation

v. Print the third element of `iArr` using pointer notation

[5 marks]

Continued .....

Question 3

a) Give four advantages of using function in C programming?

[4 marks]

b) Given the following initialization statement of `record`

```
struct stationeries record[4] = {{"pen", 3, 1.50},
      {"a4", 1, 10}, {"correction tape",1, 6.80},
      {"eraser", 1, 0.80}};
```

Figure Q3.1

i. Write the structure definition [4 marks]

ii. Write the definition of function `printRecord` that receives `record` and the size of the array as its function arguments, and prints its content using `for` statements. The function `printRecord` does not return any value. [6 marks]

iii. Write the function prototype of `printRecord`. [2 marks]

iv. Write an appropriate function call to `printRecord`. [2 marks]

c) Write a C program to produce the following table in Figure 3.2 using appropriate library (in-built) function.

```
i       i^2     i^3
-------------------------
1       1       1
2       4       8
3       9       27
4       16      64
5       25      125
6       36      216
7       49      343
8       64      512
9       81      729
10      100     1000
```

Figure 3.2

[7 marks]

Continued .....

Question 4

a) What is redirection in the context of input output file? How many input and output files can be accessed using redirection? Give one advantage and one disadvantage of redirection.

[4 marks]

b) A C program named "count.c" reads a text file called "text.txt" and counts the number of times the word "the" appears in the file.

i. What is the suitable file access mode for "count.c"? Why? [2 marks]

ii. Suggest a suitable library function from `string.h` that can be used to look for the word "the". Show its syntax. [2 marks]

iii. Write the C code for "count.c". The program should print an error message and terminate immediately when error occurs in opening "text.txt". If the file is opened successfully, the program prints the number of word "the" found in the file. [15 marks]

c) Explain each of the following statement

i. `int *a = calloc(50, sizeof(int));` [1 mark]

ii. `free(a);` [1 mark]

End of paper